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ABSTRACT

This paper addresses the role of Rural Systemic Initiatives (RSIs) in linking tribally controlled colleges to systemic reform efforts in rural communities. RSI is a program implemented in 1994 by the National Science Foundation to improve science and mathematics education in rural areas. RSIs were established in regions with low population density where more than 30 percent of school-age children live in poverty. The role of institutions of higher education in these efforts has been in areas of pre-service training to student teachers, leadership in curriculum development efforts, and research. Four RSIs in Indian country are the Alaska Native Rural Education Consortium, the Tribal College RSI, the Navajo Nation RSI, and the UCAN RSI. Associated tribal community colleges and universities are listed for each RSI. Assessment criteria for these projects have centered on "drivers" of reform: implementation of comprehensive standards-based curricula; policy development; resource convergence; broad-based support from parents, policymakers, institutions of higher education, business, and community; student achievement; and equity. The report highlights the efforts of the Alaska RSI, which encompasses over 200 remote, indigenous communities in its 586,000 square miles. The success of this project has evolved from the active participation of Native teachers and scholars, who have stimulated integration of traditional ways of knowing in curriculum development. In addition, projects have been successful in using distance learning strategies through institutions of higher education to link the delivery of services, particularly professional development, to remote communities. Costs and community benefits of RSIs are briefly discussed. (LP)

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HIGHER EDUCATION IN RURAL COMMUNITIES:

SYSTEM REFORM IN INDIGENOUS SCHOOLS

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HIGHER EDUCATION IN RURAL COMMUNITIES: SYSTEMIC REFORM IN INDIGENOUS SCHOOLS

This paper proposes to review systemic reform efforts in rural communities. Research and evaluation efforts of standards-based mathematics, science, and technology efforts include cultural components appropriate to a rural setting. The focus of this work is in establishing linkages between intervention efforts and economic benefits for rural communities. Efforts to link tribally controlled colleges to these initiatives require distance learning strategies and infrastructure, often non-existent in remote areas serving indigenous communities.

The work presented here is contextualized in efforts funded by The National Science Foundation through out rural America. The Foundation seeks to support reform efforts in rural education K-16 with two foci: American Indian/Alaska Native and Non-Indian. Early indications are that successful change efforts are dependent upon the integration of indigenous culture.

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Rural Education

The power of education to shape the economy of nations and regions is well documented. The surge of economic growth in Asia during the past five decades is further testimony to this historical relationship. Educational achievement enriches individual lives, families, and communities. Investments in education by individuals and each level of government yield a sound return in monetary ways but their contribution to the commonweal is probably even more important. The *wealth of nations*[i] lies in the interrelationships among individual education attainment, technological progress, and the social and political infrastructure of a civil society.

In sharp contrast to the 1960s and 1970s, policy development and educational practice focusing on rural education did not gain or sustain national attention during the 1990s. It has not been a priority in recent years at the federal level. This lack of emphasis is most likely the result of the following:

1. The lack of federal importance on rural education compared to special projects targeting large urban school systems by Department of Education and The National Science Foundation;
2. The general lack of emphasis on rural policy development in other areas due to the decline of products and services originating in rural communities;
3. The lack of data, including the lack of a systemic decision-making process, to contrast and compare outputs;
4. The lack of technological infrastructure to support broad-based dissemination of trends.

University policy centers on rural development are not giving emphasis to education initiatives."[ii] This perspective is a philosophical one and is counter-intuitive to other economic development strategies which hypothesize that increased successful educational experiences will cause an increase in education rates at each level. Further, this increase in knowledgeable graduates will result in an increased number of skilled and/or professional workers available to a community.

By the beginning of this decade, the literature on education began to suggest (and even insist) that students in public schools would be non-competitive in "today's global economy."[iii][iv] Throughout the decade, "global" as a descriptor is found increasingly in education literature and despite waves of criticism from various conservative groups to the general idea of a "global" education, technology, specifically the World Wide Web (WWW), has legitimized "global" as the standard descriptor in business and in education.

The link between education and economy remains as complex in this last year of the 1990s as it did at the beginning of the century. Bill Gates, in explaining the effect of the web describes it as an equalizer, e.g. the web will increasingly equalize opportunities for skilled people around the world. He

suggests that today the best indicator of an individual's income is the answer to the question "What country do you live in?" In the future, however, he predicts that the best indicator of an individual's income will be "What's your education?"[iv] Clearly, the web ignores political boundaries and establishes a new economic frontier for the millenium. The impact of the web on education is limited by our lack of rigorous research on change in curricula and is further limited by the fact that the technology of the web continues to develop faster than the theoretic knowledge base of many of the change processes.

We are currently involved in an evaluation project for the Rural Systemic Initiatives funded by the National Science Foundation (NSF). As the National Science Foundation (NSF) continues to look to communities with high populations of rural, disadvantaged youth, research and a summative evaluation of the Rural Systemic Initiative (RSI) are critical. While lessons learned from State Systemic Initiative (SSI) and Urban Systemic Initiative (USI) are beneficial to a generic understanding of systemic reform, the uniqueness of the categorical RSIs needs to be explored. In January 1998, NSF categorized the RSI program to highlight the two distinct populations and to recognize the importance of maintaining integrity within American Indian[v] cultures in the reform efforts.

RSIs target rural regions with low population densities where more than 30% of school-aged youngsters live in poverty. The current category one portfolio is outlined in Table 1. Regions are defined geographically rather than by political boundaries, however, Table 1 also indicates those boundaries. The focus of reform efforts has been K-16. The role of institutions of higher education (IHE) in these efforts has been in areas of pre-service training to student teachers, leadership in curriculum development efforts, and research. Table 1 lists the IHEs in each of the four sites.

Table 1

RSI Tribal Community Colleges and Universities	
Alaska Native Rural Education Consortium AKRSI *(rural Alaska)*	**University of Alaska-Fairbanks, Kuskokwim, Northwest, Chukchi, Bristol Bay, Interior, Southeast; Alaska Native College.**
Tribal College Rural Systemic Initiative (TCCRSI) *(Montana, North Dakota, South Dakota, Nebraska, Wyoming, Minnesota)*	**Turtle Mountain Community College; Dull Knife Memorial College; Fort Berthold Community College; Sinte Gleska University; Oglala Lakota College; Fort Belknap College; Salish Kootenai College; United Tribes Technical College; Fort Peck Community College; Sitting Bull College; SiTanka Community College; Blackfeet Community College; Sisseton Wahpeton Community College; Cankdeska Cikana Community College; Fond Du Lac Tribal and Community College; Leech Lake Tribal and Community College;**
Navajo Nation Rural Systemic Initiative (NNRSI) *(Arizona, New Mexico, Utah)*	**Northern Arizona University; University of New Mexico; Dine College; Crownpoint Institute of Technology**
UCAN RSI *(Utah-Colorado-Arizona-New Mexico)*	**Northern Arizona University; University of New Mexico; New Mexico Highlands University, Dine College; Crownpoint Institute of Technology; Southwestern Indian Polytechnic Institute**

NSF began a series of initiatives in 1990 that was designed as a response to piecemeal approaches to reform. Prior to that, reform was packaged as curriculum development or professional/staff development. The Foundation (NSF) attempted to structure reform to attain two goals[vi]:

1) To improve significantly all learning leading to high achievement in challenging science and mathematics by all students;

2) To reform K-12 (later K-16) educational systems to sustain reform that continue to lead to such results.

The RSI program was begun in 1994. While each of the systemics[vii] exhibit common elements, each remain individualized within the core set.

Indigenous Culture in Higher Education

Reform efforts in Indian country typically are contextualized by tribes and individuals with those previous efforts whose histories are rich in tradition and fact. Previous reform or change is historically documented in American history through official policies of cultural genocide[viii], assimilation, and self-determination. Indigenous people remember these reform efforts in their oral histories of first contact as well as through the most recent federal policies of self-determination (often characterized as "termination").

The effort of the National Science Foundation to create change in indigenous communities was initially met with the same reticence as previous federal efforts. Leadership in Washington, including Luther S. Williams, Assistant Director of NSF, and Gerald Gipp (Standing Rock Sioux), Program Director has been critical. In this effort, tribes have been provided the opportunity to infuse culture in SMET curricula. Assessment criteria for these projects are centered on *drivers* of reform. The six drivers are 1) implementation of comprehensive standards-based curriculum; 2) policy development; 3) resource convergence; 4) broad based support from parents, policy makers, IHE, business, and community; 5) student achievement; 6) equity.

Examples of the use of culture can be found in each of the drivers throughout the different RSIs. Policy changes are particularly complex since, for example, the Navajo Nation has schools that cross such political jurisdictions as state, tribal, Bureau of Indian Affairs[ix] or parochial. Resource converge may include state funding (including Charter schools) Bureau of Indian Affairs ISEP funding, Department of Education block grants or Title monies, and tribal grants, particularly in areas with casino revenue.

IHE have been involved in the infusion of culture in these projects at various levels. The University of Alaska-Fairbanks, under the director of Ray Barnhardt and Oscar Kawagley (Yup'ik), has used culture and distance learning technology to provide diverse opportunities. The challenge of the physical geography makes Alaska RSI (AKRSI) an interesting case study.[x] Recognizing that western science tends to emphasize compartmentalized knowledge by disciplines and that this knowledge is decontextualized and taught in the detachment of a classroom or laboratory setting, the AKRSI has worked with schools to emphasize the importance of indigenous experiences in the natural environment. In this manner, particulars (knowledge) come to be understood relative to the whole, and the "laws" are tested in the practical context of everyday survival. Western thought also differs from indigenous thought in terms of competency. In the indigenous sense, competency had an unequivocal relationship to survival or extinction. The challenge these differences in practices and perspectives pose for contemporary educators is clear.[xi]

The Alaska RSI encompasses over 200 remote, indigenous communities in its 586,000 square miles. The vast majority of the indigenous people in rural Alaska continue to rely on subsistence hunting and fishing. There is a slowly evolving cash-based economy; however, few permanent jobs exist in most communities. The range of individual income in these areas is $7,000 to $15,000.[xii]

While the linkages with the higher education system in Alaska are extensive, the most significant recent development is the successful effort to attract Kellogg Foundation involvement in establishing a Tribal College consortium. In collaboration with AKRSI, a plan to develop a Tribal College System in Alaska would provide a parallel institutional infrastructure. The effort is lead by Ilisagvik College, a prototype for other tribal colleges in the system and is expected to take three years.

Distance Learning

The Alaska Native Knowledge Network is online and forms the foundation for the distance learning activities throughout the state. Through the Center for Distance Education located at the Fairbanks campus, the Alaska RSI is using the web as a basis for delivering courses to rural teachers, as well as assisting schools in the integration of web-based technology in their curricula. The University is leading efforts to assemble curriculum resources in twelve thematic areas applicable to rural schools that will be placed on CD-ROM for distribution to all schools in the state. In June 1996, the University of Alaska established a Rural Educator Preparation Partnership program to emphasize building partnerships with rural districts to increase the number of Alaska Native teachers in remote communities. Emphasis is also placed on upgrading the cross-cultural understanding of non-Native teachers. The College of Natural Sciences at the University of Alaska Fairbanks created a Scientist-in-Residence program in order to allow practicing scientists to visit rural schools and districts for extended periods of time in order to interact with Native people. One of the most isolated rural school districts in the state (Iditarod) has been the focus of telecommunications infrastructure efforts in rural Alaska. This district has been upgraded to link all schools in a geographic region with high-capacity data transmission services to provide distance education. More recently, efforts were successful to create a "Cyber-School" aimed at serving students from throughout the state with advanced level instruction via technology.

The majority of tribally controlled community colleges working in the RSI efforts are scattered throughout the High Plains. The TCC RSI represents a vast geographic area as well. It includes sixteen tribally controlled community colleges. The Navajo Nation and UCAN RSI work with Dine College and Crownpoint Institute of Technology. Each RSI uses IHE in partnerships that assure quality and sustainability in K-16 programs.

Costs and Benefits for Institutes of Higher Education

An obvious difficulty associated with evaluating a program of this magnitude is that the same difficulty associated with educational programs in general, i.e. the costs are immediate and known. The benefits are perceived as future and sustaining. We can calculate exactly how much the Rural Systemic Initiatives have spent in any fiscal year, but we can only intuit the future benefits. Immediate benefits (within the five-year scope of the projects) may be defined as 1) improved test scores; 2) improved psychic well being; 3) improved community-school relations. In our efforts to track benefits, we have piloted a cost-benefit analysis of the Navajo RSI. Modeling of benefits reflects efforts to predict changes in retention and graduation rates.

In a recent forum hosted by the Commerce Department's National Telecommunications and Information Administration, the World Bank's Global Knowledge Partnership, and the Benton Foundation experts agreed that local communities are the keys to closing the "international digital divide."[xiii] Statistics presented at the forum from Larry Irving, assistant secretary of commerce for communications and information, included the following:

Table II

If the world were a village of 1,000 people

▪ 500 people would never have used a telephone
▪ 335 would be illiterate
▪ 10 would have a college education
▪ 1 would own a computer

Irving indicated that 80 percent of the world's telephones are located in 10 percent of the countries. The implications for IHE and rural communities involve perplexing strands of decision-making as policy makers monitor the use of information technologies at the local level. Roberto Rodrigues, coordinator for the Pan American Health Organization's Health Services Information Systems Program, notes that the real need is for education, not for more complex information technologies as promoted by industry[xiv]. Further suggestions based on local control included the need for industry to recognize technology as "demand-driven" rather than "supply-driven." The emphasis on economic benefits to a local community allows policy discussions to accommodate cultural concerns. Each of the RSIs reviewed for this presentation

collects impact data at local, regional, and RSI levels to determine if systemic change is evident in the communities. The data include achievement and attendance information for K-16, as appropriate.

SUMMARY

This paper has reviewed the impact of culture and technology on RSI schools and has highlighted tribally controlled community colleges and IHE (using Alaska RSI as the model). The success of these projects has evolved from the active participation of native teachers and scholars, including use of traditional "ways of knowing" in curriculum building. These projects use distance learning strategies through institutions of higher education to link the delivery of services, particularly professional development, to remote communities. Future considerations for research require attention to the following:

1. What, if any, are the "psychic" benefits and costs[xv] associated with reservation economies and educational attainment? How do tribal communities define wealth?
2. Does the inclusion of culturally relevant standards-based curricula impact student achievement?
3. What is the impact of technology on native communities; what are the costs/benefits associated with distance learning pedagogical development?
4. What are the most successful strategies for linking K-16 systemic reform efforts with local community partners? How is change institutionalized in areas with limited resources?

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[i] See Adam Smith in An inquiry into the nature and causes of the wealth of nations reprinted in 1937 by The Modern Library: New York.

[ii] Rural economic policy centers: www.newwest.org/ ; www.rupri.org/ ; www.aspeninst.org/

[iii] See the Wall Street Journal, Special Section on Education, February 9, 1990. Specifically, ...(schools) are producing students who lack the skills that business so desperately needs to complete in today's global economy. And in doing so, they are condemning students to a life devoid of meaningful employment.

[iv] See Business @The Speed of Thought

[v] The term American Indian is used in this paper as the equivalent of American Indian/Alaska Native/Native Hawaiian, Indian, or Native American. The terms include any person having origins in any of the original peoples of North American and maintaining cultural identification through tribal affiliation or community recognition.

[vi] Original goals in the Request for Proposal for competitive grants

[vii] For purposes of this paper, the "systemics" are defined as the State Systemic Initiatives, the Urban Systemic Initiatives, and the Rural Systemic Initiatives funded by NSF.

[viii] Email correspondence from Eric Cheyfitz, September 24, 1999: The US government had no formal genocidal policies, nothing, that is, like Hitler's Final Solution but clearly the results of US policy toward the Indians well into the twentieth century were genocidal. Lenore A. Stiffarm and Phil Lane Jr. in an essay titled "The Demography of Native North America: A Question of American Indian Survival" (in M. Annette Jaimes, ed. *The State of Native America: Genocide, Colonization and Resistance*) put the Indian population in what is now the US at 12 million at the time of first contact. By the end of the nineteenth century this figure, which is now "officially" at around 2 million, was between 250,000 and 300,000: the result of European diseases, European war against Indians (which typically involved "scorched earth" policies and governmental policies of removal that resulted in physical, social, and cultural decimation.

[ix] The BIA currently operates three types of schools throughout the United States, those governed by PL 95-561; PL. 100-297 (grant); PL 93-638 (contract).

[x] The Alaska RSI maintains a web site at the following URL: http://www.unkn.uaf.edu/npe.html

[xi] Original proposal for Alaska Native/Rural Education Consortium, Barnhardt and Kawagley

[xii] 1990 survey by the University of Alaska.

[xiii] TIIAP Update, Volume 2, Number 3, September 1999 p. 3-4.

[xiv] Ibid.

[xv] Deaton, Brady, et al. (1982, May). The influence of psychic costs on rural-urban migration. American Agricultural Economics Association. American Journal of Agricultural Economics p. 177-187.